SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product information

Product Name: Toluene Standardization Fuel 99.8
Material: 1024331, 1024334, 1024333, 1024332

Use: Reference Fuel

Company: Chevron Phillips Chemical Company LP
Specialty Chemicals
10001 Six Pines Drive
The Woodlands, TX 77380

Emergency telephone:

Health:
866.442.9628 (North America)
1.832.813.4984 (International)

Transport:
CHEMTREC 800.424.9300 or 703.527.3887(int'l)
Asia: +800 CHEMCALL (+800 2436 2255) China:+86-21-22157316
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600

Responsible Department: Product Safety and Toxicology Group
E-mail address: SDS@CPChem.com
Website: www.CPChem.com

SECTION 2: Hazards identification

Classification of the substance or mixture
This product has been classified in accordance with the hazard communication standard 29 CFR 1910.1200; the SDS and labels contain all the information as required by the standard.

Emergency Overview

Danger
Form: Liquid  Physical state: Liquid  Color: Clear  Odor: Strong gasoline
OSHA Hazards: Flammable Liquid, Aspiration hazard, Moderate skin irritant, Moderate eye irritant, Reproductive hazard, Target Organ Effects

Classification

SDS Number: 100000014256 1/17
Flammable liquids, Category 2
Skin irritation, Category 2
Eye irritation, Category 2A
Reproductive toxicity, Category 2
Specific target organ systemic toxicity - single exposure, Category 3, Central nervous system
Specific target organ systemic toxicity - repeated exposure, Category 2, Auditory organs
Aspiration hazard, Category 1

Labeling

Symbol(s): 

Hazard Statements:
H225: Highly flammable liquid and vapor.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H319: Causes serious eye irritation.
H336: May cause drowsiness or dizziness.
H361: Suspected of damaging fertility or the unborn child.
H373: May cause damage to organs (Auditory organs) through prolonged or repeated exposure.

Precautionary Statements:
Prevention:
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat/sparks/open flames/hot surfaces.
No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ventilating/lighting/equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P260 Do not breathe dust/fume/gas/mist/vapor/spray.
P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/eye protection/face protection.
P281 Use personal protective equipment as required.

Response:
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/attention.
Toluene Standardization Fuel 99.8

P331  Do NOT induce vomiting.
P332 + P313  If skin irritation occurs: Get medical advice/ attention.
P337 + P313  If eye irritation persists: Get medical advice/ attention.
P362  Take off contaminated clothing and wash before reuse.
P370 + P378  In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

Storage:
P403 + P233  Store in a well-ventilated place. Keep container tightly closed.
P403 + P235  Store in a well-ventilated place. Keep cool.
P405  Store locked up.

Disposal:
P501  Dispose of contents/ container to an approved waste disposal plant.

Carcinogenicity:
IARC  No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP  No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
ACGIH  No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

SECTION 3: Composition/information on ingredients

Molecular formula  :  Mixture

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>73 - 75</td>
</tr>
<tr>
<td>n-Heptane</td>
<td>142-82-5</td>
<td>15 - 17</td>
</tr>
<tr>
<td>2,2,4-Trimethylpentane (Isooctane)</td>
<td>540-84-1</td>
<td>9 - 11</td>
</tr>
</tbody>
</table>

SECTION 4: First aid measures

General advice  :  Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Symptoms of poisoning may appear several hours later. Do not leave the victim unattended.

If inhaled      :  Move to fresh air. If symptoms persist, call a physician.

In case of skin contact  :  If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact  :  Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
**SAFETY DATA SHEET**

**Toluene Standardization Fuel 99.8**

**Version 1.6**

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If swallowed: Keep respiratory tract clear. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Take victim immediately to hospital.

### SECTION 5: Firefighting measures

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash point</td>
<td>-12 °C (10 °F) estimated</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>204 - 480 °C (399 - 896 °F) estimated</td>
</tr>
<tr>
<td>Suitable extinguishing media</td>
<td>Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical.</td>
</tr>
<tr>
<td>Unsuitable extinguishing media</td>
<td>High volume water jet.</td>
</tr>
<tr>
<td>Specific hazards during fire fighting</td>
<td>Do not allow run-off from fire fighting to enter drains or water courses.</td>
</tr>
<tr>
<td>Special protective equipment for fire-fighters</td>
<td>Wear self-contained breathing apparatus for firefighting if necessary.</td>
</tr>
<tr>
<td>Further information</td>
<td>Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.</td>
</tr>
<tr>
<td>Fire and explosion protection</td>
<td>Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.</td>
</tr>
</tbody>
</table>

### SECTION 6: Accidental release measures

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal precautions</td>
<td>Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.</td>
</tr>
<tr>
<td>Environmental precautions</td>
<td>Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.</td>
</tr>
<tr>
<td>Methods for cleaning up</td>
<td>Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).</td>
</tr>
</tbody>
</table>

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4/17
SECTION 7: Handling and storage

Handling

Advice on safe handling: Avoid formation of aerosol. Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations. Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary, but may not by themselves be sufficient. Review all operations, which have the potential to generating and accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106 “Flammable and Combustible Liquids”; National Fire Protection Association (NFPA 77), "Recommended Practice on Static Electricity"; and/or the American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising Out of Static, Lightning, and stray Currents".

Advice on protection against fire and explosion: Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

Storage

Requirements for storage areas and containers: No smoking. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

SECTION 8: Exposure controls/personal protection

Ingredients with workplace control parameters

<table>
<thead>
<tr>
<th>US</th>
<th>Ingredients</th>
<th>Basis</th>
<th>Value</th>
<th>Control parameters</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Toluene</td>
<td>ACGIH</td>
<td>TWA</td>
<td>20 ppm,</td>
<td>BEI, A4,</td>
</tr>
<tr>
<td></td>
<td>OSHA Z-2</td>
<td>TWA</td>
<td>200 ppm,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-3</td>
<td>CEIL</td>
<td>300 ppm,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-2</td>
<td>Peak</td>
<td>500 ppm,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1-A</td>
<td>TWA</td>
<td>100 ppm, 375 mg/m3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1-A</td>
<td>STEL</td>
<td>150 ppm, 580 mg/m3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n-Heptane</td>
<td>ACGIH</td>
<td>TWA</td>
<td>500 ppm, 2,000 mg/m3</td>
<td>(b)</td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1-A</td>
<td>TWA</td>
<td>500 ppm, 1,600 mg/m3</td>
<td>(b)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1-A</td>
<td>STEL</td>
<td>500 ppm, 2,000 mg/m3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2,2,4-Trimethylpentane (Isooctane)</td>
<td>ACGIH</td>
<td>TWA</td>
<td>400 ppm,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>300 ppm,</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Substance name</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>Immediately Dangerous to Life or Health Concentration Value 500 ppm</td>
<td>1995-03-01</td>
</tr>
<tr>
<td>n-Heptane</td>
<td>142-82-5</td>
<td>Immediately Dangerous to Life or Health Concentration Value 750 ppm</td>
<td>1995-03-01</td>
</tr>
</tbody>
</table>

Immediately Dangerous to Life or Health Concentrations (IDLH)

Biological exposure indices

US

<table>
<thead>
<tr>
<th>Substance name</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Sampling time</th>
<th>Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>Toluene: 0.02 mg/l (In blood)</td>
<td>Prior to last shift of workweek</td>
<td>2010-03-01</td>
</tr>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>Toluene: 0.03 mg/l (Urine)</td>
<td>End of shift (As soon as possible after exposure ceases)</td>
<td>2010-03-01</td>
</tr>
<tr>
<td>o-Cresol</td>
<td></td>
<td>o-Cresol: 0.3 mg/g Creatinine (Urine)</td>
<td>End of shift (As soon as possible after exposure ceases)</td>
<td>2010-03-01</td>
</tr>
</tbody>
</table>

Engineering measures

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the workplace when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment

Respiratory protection: Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as: Air-Purifying Respirator for Organic Vapors. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

Hand protection: The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
Eye protection : Eye wash bottle with pure water. Tightly fitting safety goggles.

Skin and body protection : Choose body protection according to the amount and concentration of the dangerous substance at the work place. Wear as appropriate: Flame retardant antistatic protective clothing. Workers should wear antistatic footwear.

Hygiene measures : When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

SECTION 9: Physical and chemical properties

<table>
<thead>
<tr>
<th>Information on basic physical and chemical properties</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
</tr>
<tr>
<td>Form : Liquid</td>
</tr>
<tr>
<td>Physical state : Liquid</td>
</tr>
<tr>
<td>Color : Clear</td>
</tr>
<tr>
<td>Odor : Strong gasoline</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Safety data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash point : -12 °C (10 °F) estimated</td>
</tr>
<tr>
<td>Lower explosion limit : 0.95 % (V)</td>
</tr>
<tr>
<td>Upper explosion limit : 7.1 % (V)</td>
</tr>
<tr>
<td>Oxidizing properties : no</td>
</tr>
<tr>
<td>Autoignition temperature : 204 - 480 °C (399 - 896 °F) estimated</td>
</tr>
<tr>
<td>Molecular formula : Mixture</td>
</tr>
<tr>
<td>Molecular weight : Not applicable</td>
</tr>
<tr>
<td>pH : Not applicable</td>
</tr>
<tr>
<td>Freezing point : No data available</td>
</tr>
<tr>
<td>Boiling point/boiling range : 98 - 111 °C (208 - 232 °F) estimated</td>
</tr>
<tr>
<td>Vapor pressure : No data available</td>
</tr>
<tr>
<td>Relative density : 0.823 at 15.6 °C (60.1 °F)</td>
</tr>
<tr>
<td>Water solubility : Negligible</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water : No data available</td>
</tr>
<tr>
<td>Viscosity, kinematic : No data available</td>
</tr>
<tr>
<td>Relative vapor density : No data available</td>
</tr>
</tbody>
</table>
SECTION 10: Stability and reactivity

Chemical stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions
Conditions to avoid: Avoid contact with strong oxidants. Heat, flames and sparks.
Materials to avoid: May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Other data: No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

Toluene Standardization Fuel 99.8
Acute oral toxicity: Acute toxicity estimate: > 5,000 mg/kg
Species: Rat
Method: Expert judgment

Toluene Standardization Fuel 99.8
Acute inhalation toxicity: Acute toxicity estimate: > 20 mg/l
Exposure time: 4 h
Species: Rat
Test atmosphere: vapor
Method: Expert judgment

Toluene Standardization Fuel 99.8
Acute dermal toxicity: Acute toxicity estimate: > 5,000 mg/kg
Species: Rabbit
Method: Expert judgment

Toluene Standardization Fuel 99.8
Skin irritation: May cause skin irritation in susceptible persons.

Toluene Standardization Fuel 99.8
Eye irritation: Vapors may cause irritation to the eyes, respiratory system and the skin.

Toluene Standardization Fuel 99.8
Sensitization: Does not cause skin sensitization. Estimated based on individual component values.
Repeated dose toxicity

Toluene

Species: Rat
Application Route: Inhalation
Dose: 0, 100, 625, 1250, 3000 ppm
Exposure time: 15 wk
Number of exposures: 6.5 h/d, 5 d/wk
NOEL: 625 ppm

Species: Mouse
Application Route: Inhalation
Dose: 0, 100, 625, 1250, 3000 ppm
Exposure time: 14 wk
Number of exposures: 6.5 h/d, 5 d/wk
NOEL: 100 ppm

n-Heptane

Species: Rat, male
Sex: male
Application Route: Inhalation
Dose: 12.47 mg/l
Exposure time: 16 wk
Number of exposures: 12 h/d, 7 d/wk
NOEL: 12.47 mg/l

No adverse effect has been observed in chronic toxicity tests.

2,2,4-Trimethylpentane (Isooctane)

Species: Rat, Male and female
Sex: Male and female
Application Route: Inhalation
Dose: 0, 668, 2220, 6646 ppm
Exposure time: 13 weeks
Number of exposures: 6 hr/day 5 d/wk
NOEL: 8.117 mg/l 2220 ppm
Method: OECD Guideline 413
Information given is based on data obtained from similar substances.

Carcinogenicity

Toluene

Species: Rat
Dose: 0, 600, 1200 ppm
Exposure time: 2 yrs
Number of exposures: 6.5 h/d, 5 d/wk
Remarks: No evidence of carcinogenicity

Species: Mouse
Dose: 0, 600, 1200 ppm
Exposure time: 2 yrs
Number of exposures: 6.5 h/d, 5 d/wk
Remarks: No evidence of carcinogenicity

Reproductive toxicity

Toluene

Species: Rat
Application Route: Inhalation
Dose: 0, 100, 500, 2000 ppm
Test period: 95 d
NOAEL Parent: 2000 ppm

n-Heptane

Species: Rat
Application Route: Inhalation
Dose: 0, 900, 3000, 9000 ppm
Number of exposures: 6 hr/d, 5 d/wk
Test period: 13 wk
Method: OECD Test Guideline 416
NOAEL Parent: 9000 ppm
NOAEL F1: 3000 ppm
NOAEL F2: 3000 ppm

2,2,4-Trimethylpentane (Isooctane) Species: Rat
Sex: male and female
Application Route: Inhalation
Dose: 0, 900, 3000, 9000 ppm
Number of exposures: 6 h/d 5 d/wk
Method: OECD Test Guideline 416
NOAEL Parent: 3000 ppm
NOAEL F1: 3000 ppm
NOAEL F2: 3000 ppm
Information given is based on data obtained from similar substances.

Developmental Toxicity

Toluene Species: Rat
Application Route: Inhalation
Dose: 0, 100, 500, 2000 ppm
Test period: 95 d
NOAEL Teratogenicity: 400-750 ppm

n-Heptane Species: Rat
Application Route: Inhalation
Dose: 0, 900, 3000, 9000 ppm
Exposure time: GD6-15
Number of exposures: 6 hrs/d
NOAEL Teratogenicity: 9000 ppm
NOAEL Maternal: 3000 ppm

2,2,4-Trimethylpentane (Isooctane) Species: Rat
Application Route: Inhalation
Dose: 0, 400, 1200 ppm
Number of exposures: 6h/d
Test period: GD6-15
NOAEL Teratogenicity: 1200 ppm
NOAEL Maternal: 1200 ppm
Information given is based on data obtained from similar substances.

Species: Rat
Application Route: Inhalation
Dose: 0, 900, 3000, 9000 ppm
Number of exposures: 6h/d
Test period: GD6-15
Method: OECD Guideline 414
NOAEL Teratogenicity: 9000 ppm
NOAEL Maternal: 3000 ppm
Information given is based on data obtained from similar substances.
Toluene Standardization Fuel 99.8

Aspiration toxicity: May be fatal if swallowed and enters airways.

CMR effects:

- **Toluene**
  - Carcinogenicity: Not classifiable as a human carcinogen.
  - Mutagenicity: Animal testing did not show any mutagenic effects.
  - Teratogenicity: Some evidence of adverse effects on development, based on animal experiments.
  - Reproductive toxicity: Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

- **n-Heptane**
  - Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
  - Teratogenicity: Animal testing did not show any effects on fetal development.
  - Reproductive toxicity: No toxicity to reproduction.

- **2,2,4-Trimethylpentane (Isooctane)**
  - Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
  - Teratogenicity: Animal testing did not show any effects on fetal development.
  - Reproductive toxicity: Animal testing did not show any effects on fertility.

Further information:

- Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Concentrations substantially above the TLV value may cause narcotic effects. Solvents may degrease the skin.

SECTION 12: Ecological information

**Toxicity to fish**

- **Toluene**
  - LC50: 18 - 36 mg/l
  - Exposure time: 96 h
  - Species: Pimephales promelas (fathead minnow)

- **n-Heptane**
  - LL50: 1.284 mg/l
  - Exposure time: 96 h
  - Species: Oncorhynchus mykiss (rainbow trout)
  - Method: QSAR

  - LC50: 375 mg/l
  - Exposure time: 96 h
  - Species: Tilapia mosambica (Fish)

- **2,2,4-Trimethylpentane (Isooctane)**
  - LC50: 0.11 mg/l
  - Exposure time: 96 h
  - Species: Oncorhynchus mykiss (rainbow trout)
  - semi-static test Method: OECD Test Guideline 203
  - Information given is based on data obtained from similar substances.
Toxicity to daphnia and other aquatic invertebrates

**Toluene**
- EC50: 3.78 mg/l
- Exposure time: 48 h
- Species: Daphnia magna (Water flea)

**n-Heptane**
- EC50: 1.5 mg/l
- Exposure time: 48 h
- Species: Daphnia magna (Water flea)
- Static test: Toxic to aquatic organisms.
- LC50: 0.1 mg/l
- Exposure time: 96 h
- Species: Mysis bahia (mysid shrimp)
- Static test: Very toxic to aquatic organisms.

**2,2,4-Trimethylpentane (Isooctane)**
- EC50: 0.4 mg/l
- Exposure time: 48 h
- Species: Daphnia magna (Water flea)
- Static test: Information given is based on data obtained from similar substances.

Toxicity to algae

**Toluene**
- EC50: 134 mg/l
- Exposure time: 72 h
- Species: Chlamydomonas angulosa (Green algae)

**n-Heptane**
- EL50: 4.338 mg/l
- Exposure time: 72 h
- Species: Pseudokirchneriella subcapitata (microalgae)
- Method: QSAR

**2,2,4-Trimethylpentane (Isooctane)**
- EL50: 2.943 mg/l
- Exposure time: 72 h
- Method: QSAR modeled data

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

**2,2,4-Trimethylpentane (Isooctane)**
- NOEC: 0.17 mg/l
- Exposure time: 21 d
- Species: Daphnia magna (Water flea)

Elimination information (persistence and degradability)

Biodegradability: Expected to be inherently biodegradable.

Ecotoxicology Assessment

Acute aquatic toxicity
- **Toluene**: Toxic to aquatic life.
- **n-Heptane**: Very toxic to aquatic life.
- **2,2,4-Trimethylpentane (Isooctane)**: Very toxic to aquatic life.
Chronic aquatic toxicity

Toluene : Harmful to aquatic life with long lasting effects.
n-Heptane : Very toxic to aquatic life with long lasting effects.
2,2,4-Trimethylpentane (Isooctane) : Very toxic to aquatic life with long lasting effects.

Results of PBT assessment

Toluene : Non-classified vPvB substance, Non-classified PBT substance
n-Heptane : Non-classified PBT substance, Non-classified vPvB substance
2,2,4-Trimethylpentane (Isooctane) : Non-classified PBT substance, Non-classified vPvB substance

Additional ecological information : Toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Product : The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

SECTION 14: Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.). Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)

UN1268, PETROLEUM DISTILLATES, N.O.S., 3, II, MARINE POLLUTANT, (N-HEPTANE, 2,2,4-TRIMETHYLPPENTANE (ISOOCTANE))

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)

UN1268, PETROLEUM DISTILLATES, N.O.S., 3, II, (-12 °C), MARINE POLLUTANT, (N-HEPTANE, 2,2,4-TRIMETHYLPPENTANE (ISOOCTANE))
IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN1268, PETROLEUM DISTILLATES, N.O.S., 3, II

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN1268, PETROLEUM PRODUCTS, N.O.S., 3, II, (D/E), ENVIRONMENTALLY HAZARDOUS, (N-HEPTANE, 2,2,4-TRIMETHYLPENTANE (ISOOCTANE))

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
UN1268, PETROLEUM PRODUCTS, N.O.S., 3, II, ENVIRONMENTALLY HAZARDOUS, (N-HEPTANE, 2,2,4-TRIMETHYLPENTANE (ISOOCTANE))

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN1268, PETROLEUM PRODUCTS, N.O.S., 3, II, ENVIRONMENTALLY HAZARDOUS, (N-HEPTANE, 2,2,4-TRIMETHYLPENTANE (ISOOCTANE))

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

SECTION 15: Regulatory information

National legislation

SARA 311/312 Hazards : Fire Hazard
                      : Acute Health Hazard
                      : Chronic Health Hazard

CERCLA Reportable Quantity : 1346 lbs
                           : Toluene

SARA 302 Reportable Quantity : This material does not contain any components with a SARA 302 RQ.

SARA 302 Threshold Planning Quantity : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 304 Reportable Quantity : This material does not contain any components with a section 304 EHS RQ.
SARA 313 Ingredients: The following components are subject to reporting levels established by SARA Title III, Section 313:

: Toluene - 108-88-3

Clean Air Act

Ozone-Depletion Potential: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 12 (40 CFR 61):

: Toluene - 108-88-3
: 2,2,4-Trimethylpentane (Isooctane) - 540-84-1

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489):

: Toluene - 108-88-3

US State Regulations

Pennsylvania Right To Know:

: n-Heptane - 142-82-5
: 2,2,4-Trimethylpentane (Isooctane) - 540-84-1
: Toluene - 108-88-3

New Jersey Right To Know:

: n-Heptane - 142-82-5
: 2,2,4-Trimethylpentane (Isooctane) - 540-84-1
: Toluene - 108-88-3

California Prop. 65 Ingredients: WARNING: This product contains a chemical known in the State of California to cause birth defects or other reproductive harm.

Notification status:

Europe REACH: On the inventory, or in compliance with the inventory
United States of America TSCA: On the inventory, or in compliance with the inventory
Canada DSL: On the inventory, or in compliance with the inventory
Australia AICS: On the inventory, or in compliance with the inventory
New Zealand NZIoC: On the inventory, or in compliance with the inventory
Japan ENCS: On the inventory, or in compliance with the inventory
Korea KECI: On the inventory, or in compliance with the inventory
NFPA Classification : Health Hazard: 2  
Fire Hazard: 3  
Reactivity Hazard: 0

Further information
Legacy SDS Number : 647600

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

<table>
<thead>
<tr>
<th>Key or legend to abbreviations and acronyms used in the safety data sheet</th>
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| SARA | Superfund Amendments and
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<tr>
<th>Acronym</th>
<th>Description</th>
<th>Reauthorization Act.</th>
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<td>IARC</td>
<td>International Agency for Research on Cancer</td>
<td>TLV</td>
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<td>IECSC</td>
<td>Inventory of Existing Chemical Substances in China</td>
<td>TWA</td>
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<td>ENCS</td>
<td>Japan, Inventory of Existing and New Chemical Substances</td>
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<td>Korea, Existing Chemical Inventory</td>
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<td>LC50</td>
<td>Lethal Concentration 50%</td>
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|       |                                                 |                      |
|       | Unknown or Variable Composition, Complex Reaction Products, and Biological Materials |                      |
|       | Workplace Hazardous Materials Information System |                      |